

WHAT IS CLAIMED IS:

1. A molded cross vehicle beam comprising:
 - (a) a rigid support having a first surface, a second surface and a plurality of perforations having edges;
 - (b) at least one attachment element having a first surface, a second surface and a plurality of perforations having edges, said attachment element providing means of attaching said molded cross vehicle beam to a separate structure; and
 - (c) a rigid molded member of thermoplastic material, at least a portion of said rigid molded member being in abutting relationship with the first surface of said rigid support (a) and the first surface of said attachment element (b), said rigid molded member having a hollow interior,
- 15 wherein said molded cross vehicle beam is prepared by a process comprising blow molding a thermoplastic parison precursor of said rigid molded member (c) onto the first surface of said rigid support (a) and the first surface of said attachment element (b), a portion of the thermoplastic material of said thermoplastic parison extends through at least some of
- 20 said perforations of said rigid support (a) and said attachment element (b), the edges of said perforations being embedded in the plastic material extending therethrough, thereby fixedly attaching said rigid molded member (c) to said rigid support (a) and said attachment element (b).
- 25 2. The molded cross vehicle beam of Claim 1 wherein said rigid support (a) and said attachment element (b) are each independently fabricated from a material selected from metal, thermoset plastic material, thermoplastic material and combinations thereof.
- 30 3. The molded cross vehicle beam of Claim 2 wherein said rigid support (a) and said attachment element (b) are each fabricated from metal.

4. The molded cross vehicle beam of Claim 1 wherein the thermoplastic material of said rigid molded hollow member (c) is selected from at least one of thermoplastic polyolefins, thermoplastic polyvinylchlorine, thermoplastic polyurethanes, thermoplastic polyureas, 5 thermoplastic polyamides, thermoplastic polyesters and thermoplastic polycarbonates.

5. The molded cross vehicle beam of Claim 1 wherein the thermoplastic material of said rigid molded hollow member (c) is reinforced 10 with a material selected from glass fibers, carbon fibers, metal fibers, polyamide fibers and mixtures thereof.

6. The molded cross vehicle beam of Claim 1 wherein said rigid molded hollow member (c) is further fixedly attached to at least one of said 15 rigid support (a) and said attachment element (b) by attachment means selected from fasteners, adhesives and combinations thereof.

7. The molded cross vehicle beam of Claim 1 wherein said rigid support (a) and said attachment element (b) have edges, and said rigid 20 molded hollow member (c) is further fixedly attached to at least one of said rigid support (a) and said attachment element (b) by means of at least one of:

- (i) portions of said rigid molded hollow member (c) wrapping around and embedding at least a portion of the edges of said 25 rigid support (a); and
- (ii) portions of said rigid molded hollow member (c) wrapping around and embedding at least a portion of the edges of said attachment element (b).

30 8. The molded cross vehicle beam of Claim 1 wherein said rigid support (a) has a plurality of anchoring extensions extending into said rigid molded hollow member (c), each of said anchoring extensions having

walls, an interior chamber and at least one wall perforation in said walls, each wall perforation having edges, a portion of said rigid molded hollow member (c) extends through at least some of said wall perforations into said chamber, the edges of said wall perforations being embedded in the

5 plastic material extending therethrough, thereby fixedly attaching said rigid molded hollow member (c) to said rigid support (a).

9. The molded cross vehicle beam of Claim 1 wherein said attachment element (b) has a plurality of anchoring extensions extending

10 into said rigid molded hollow member (c), each of said anchoring extensions having walls, an interior chamber and at least one wall perforation in said walls, each wall perforation having edges, a portion of said rigid molded hollow member (c) extends through at least some of said wall perforations into said chamber, the edges of said wall perforations

15 being embedded in the plastic material extending therethrough, thereby fixedly attaching said rigid molded hollow member (c) to said attachment element (b).

10. The molded cross vehicle beam of Claim 1 wherein said rigid

20 molded hollow member (c) is a continuous unitary molded hollow member.

11. The molded cross vehicle beam of Claim 1 wherein said molded cross vehicle beam is an automotive molded cross vehicle beam.

25 12. The molded cross vehicle beam of Claim 10 wherein said rigid molded hollow member (c) is an air duct.

13. The molded cross vehicle beam of Claim 1 wherein at least some of said perforations of said rigid support (a) have deformed edge

30 portions, and said deformed edge portions are embedded in the plastic material extending therethrough.

14. The molded cross vehicle beam of Claim 1 wherein at least some of said perforations of said attachment element (b) have deformed edge portions, and said deformed edge portions are embedded in the plastic material extending therethrough.

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15. The molded cross vehicle beam of Claim 1 wherein during the blow molding step, at least one of:

10 (i) increased gaseous pressure is provided on the interior of said thermoplastic parison; and
(ii) reduced gaseous pressure is provided on the second surface of at least one of said rigid support (a) and said attachment element (b),

15 thereby forcing portions of said thermoplastic parison through at least some of said perforations of said rigid support and said attachment element.

16. The molded cross vehicle beam of Claim 1 wherein said attachment element (b) is a rigid attachment element.

20 17. The molded cross vehicle beam of Claim 16 wherein said rigid attachment element (b) is continuous with said rigid support (a).

18. The molded cross vehicle beam of Claim 1 wherein at least one of:

25 (i) a portion of the first surface of said attachment element (b) abuts a portion of the second surface of said rigid support (a); and
(ii) a portion of the first surface of rigid support (a) abuts a portion of the second surface of said attachment element (b),
30 with each of (i) and (ii) at least some of the perforations of said attachment element (b) and the perforations of said rigid support (a) are aligned, the aligned perforations having edges, a portion of the thermoplastic material

of said thermoplastic parison extends through at least some of the aligned perforations, the edges of the aligned perforations being embedded in the plastic material extending therethrough, thereby further fixedly attaching said rigid molded member (c) to said rigid support (a) and said attachment element (b).

19. A method of preparing a molded cross vehicle beam comprising a rigid molded hollow thermoplastic member fixedly attached to a rigid support and at least one attachment element, said method comprising:

- (I) placing said rigid support and said attachment element in a mold,
said rigid support having a plurality of perforations having edges, a first surface and a second surface, and
said attachment element having a plurality of perforations having edges, a first surface and a second surface; and
- (II) blow molding a thermoplastic parison precursor of said rigid hollow member against the first surface of said rigid support and the first surface of said attachment element;
wherein a portion of the thermoplastic material of said thermoplastic parison extends through at least some of said perforations of said rigid support and said attachment element, the edges of said perforations being embedded in the plastic material extending therethrough, thereby attaching fixedly said rigid hollow member to said rigid support and to said attachment element.

20. The method of Claim 19 wherein during blow molding step (II), at least one of:

- (i) increased gaseous pressure is provided on the interior of said thermoplastic parison; and

- (ii) reduced gaseous pressure is provided on the second surface of at least one of said rigid support and said attachment element,
- thereby forcing portions of said thermoplastic parison through at least
- 5 some of said perforations of said rigid support and said attachment element.